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March 6, 2006

Via e-mail and U.S. Mail

Office of Electricity Delivery and Energy Reliability  
OE-20  
U.S. Department of Energy  
Forestall Building, Room 6H-050  
1000 Independence Avenue, S.W.  
Washington, DC 20585

**Re: Considerations for Transmission Congestion Study and Designation of National Interest Electric Transmission Corridors**

San Diego Gas and Electric Company ("SDG&E") appreciates the opportunity to comment on the plan of the Department of Energy ("Department") for an electricity transmission congestion study and possible designation of National Interest Electric Transmission Corridors ("NIETCs"), as called for in section 1221 of the Energy Policy Act of 2005 (the "Act"). 71 Fed. Reg. 5660 (February 2, 2006).

SDG&E urges the Department of Energy to identify now as an NIETC the corridor linking power sources in the desert southwest to San Diego, across the Imperial Valley, California. The California Energy Commission has already concluded that a project through this corridor is essential and meets the type of criteria that the Department has identified for NIETCs, stating that such a project --

"...would provide significant near-term system reliability benefits to California, reduce system congestion and its resultant costs, and provide an interconnection to both renewable resources located in the Imperial Valley and lower-cost out-of-state generation. Without this proposed project, it is unlikely that SDG&E will be able to meet the state's RPS [Renewable Portfolio Standard] goals, ensure system reliability, or reduce RMR [Reliability Must Run] and congestion costs. The Energy Commission therefore believes that the proposed project offers significant benefits and recommends that it move forward expeditiously so that the residents of San Diego and all of California can begin to realize these benefits by 2010."<sup>1</sup>

SDG&E's comments will be directed mainly at supporting early designation of this corridor as an NIETC, through application of the Draft Criteria provided in the Department's notice. As part

<sup>1</sup> California Energy Commission, "Strategic Transmission Investment Plan" at 6 (November, 2005).

of demonstrating the acute need for early designation of a specific corridor, SDG&E will discuss the factors that most heavily weigh on such a designation, both in the case of this corridor, and in the case of corridors generally. Because there is overlap in some of the Draft Criteria, we will not respond to all of them individually. We do, however, propose that the Department consider an additional criterion to adequately cover all of the considerations outlined by Congress. Specifically, there should be an individual criterion for defense and homeland security considerations.

### **Criteria Development**

The Department has indicated that it is inviting comment on the criteria that it should use in designating corridors. In subsection (4) (E), the Act indicates that “the Secretary may consider whether... (E) the designation would enhance national defense and homeland security.” SDG&E feels that this is a critical consideration specifically called out by Congress, and should be added as one of the criteria the Department considers.

From the perspective of national security, reliability of service to the San Diego area is particularly important. Military bases in San Diego are critical to our national defense and play an integral role in Homeland Security. San Diego is the home base for the U.S. Pacific Fleet on the west coast. In addition, Camp Pendleton, the largest Marine Corps Base in the United States comprising over 125,000 acres is also located in San Diego County. The Navy and Marine Corps have 16 bases in San Diego County and are SDG&E’s single largest transmission service customer, comprising over 15% of the total electric demand requirement in SDG&E’s service area on peak. The total military population on these bases is approximately 108,000 military personnel and over 20,000 civilian personnel. In addition to the military bases, the Navy and Marine Corps also have over 20,000 family housing units that house over 101,000 military dependents.

Reliable and economic electric power supplies for the Navy and Marine Corps bases in San Diego County are critical both from a national security standpoint and to support Homeland Security initiatives. North Island Naval Air Station is the home base for three nuclear powered aircraft carriers. Each of these aircraft carriers requires reliable and stable electric power to support ancillary nuclear power support equipment. Nuclear powered submarines are based at the Navy Submarine Base in Point Loma and also require reliable and dependable electric service to carry out their assigned mission. Quality of life issues for the Navy are extremely important. Without reliable electricity shore-based supplies, Navy personnel will need to remain onboard ships after returning from extended deployments to keep shipboard equipment operating.

As the single largest west coast base for the Navy and Marine Corps, the Navy is constantly deploying ships and aircraft squadrons to overseas destinations. The deployment schedules are classified information, so it is difficult to determine how many ships and squadrons will be in port at any one point in time. This means that electric demand requirements will vary depending on the number of ships in port in San Diego. Current readiness levels for naval forces in San Diego require all combatants to be ready to deploy with extremely short notice. Consequently, electric service must be available at all times and must be flexible, in order to meet the demands

of the various Navy and Marine Corps units. In addition to the many surface and air combatants based in San Diego, there are also large military data and communications centers necessary for national security that require reliable electric service.

A prolonged lack of reliable electric service in San Diego would seriously cripple the defense capability of the Navy and Marine Corps bases in San Diego and would need to be reported to the United States Congress immediately.

### **Criterion 1: Action is needed to maintain high reliability**

SDG&E currently provides electric utility service to 3.3 million customers through approximately 1.3 million retail meters in a service area that includes all of San Diego County and the southern part of Orange County, California. San Diego is the nation's seventh largest city and the nation's sixth largest county with an economy in excess of \$70 billion of goods and services per year (not including the substantial area served in Orange County), and SDG&E is the sole electric utility serving this area. Demand in this area is served by a combination of internal capacity and imported power, virtually all of which is delivered through two points of interconnection—a 500 kV line at SDG&E's Miguel substation<sup>2</sup> that accesses power from the east and south, and a series of 230 kV lines connecting through the San Onofre Nuclear Generating Station ("SONGS") switchyard to the north.<sup>3</sup> Neither of these paths is capable of serving the full peak-load requirements of the SDG&E local reliability area if the other is out of service.

Among the large electric service areas in the State, only San Diego is so underserved. SDG&E's sole 500 kV interconnection to the grid is the Southwest Powerlink ("SWPL"), a 500 kV transmission line connecting the Palo Verde Nuclear Generating Station in Arizona and SDG&E's Miguel Substation in California.<sup>4</sup> The SWPL was constructed primarily to import reliable and cost-effective energy from the desert Southwest into California. As a result of growing loads in Southern California, coupled with the addition of new generation in the desert Southwest, including new generation located in Mexico that is connected directly to the existing Imperial Valley substation, the import capability into the San Diego area is often fully utilized. The SWPL is owned jointly by SDG&E, Arizona Public Service Company ("APS"), and the Imperial Irrigation District ("IID").<sup>5</sup> Of the co-owners, only SDG&E has turned over its share of

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<sup>2</sup> The SDG&E electric transmission system is also interconnected with Comision Federal de Electricidad ("CFE") in Mexico through two 230 kV transmission lines (Path 45), one at the Imperial Valley substation and the other at the Miguel substation.

<sup>3</sup> SONGS, while geographically located within SDG&E's service area, is connected to the SCE transmission system, and, from an electric reliability perspective, is outside the San Diego local reliability area.

<sup>4</sup> See, *In re Application of SDG&E for Certificate to Construct and Operate a 500 kV Transmission Line*, D.93785, 7 CPUC 2d 301 (1981).

<sup>5</sup> Pursuant to contracts executed in 1981 and 1983, SDG&E transferred specified undivided interests in portions of SWPL to APS and IID, respectively. As a result, SWPL is owned jointly by SDG&E, APS, and IID in ownership shares that vary among the segments of the line. The Palo Verde to North Gila segment is owned by SDG&E, APS and IID in shares of 76.22%, 11%, and 12.78%, respectively. The North Gila to Imperial Valley segment is owned by SDG&E and IID in shares of 85.64% and 14.36%, respectively. The Imperial Valley to Miguel segment is wholly-owned by SDG&E.

the SWPL to the operational control of the California Independent System Operator Corporation ("CAISO"). Thus, only SDG&E's share of the line is subject to the comparability and non-discrimination requirements of the CAISO tariff on file with the Federal Energy Regulatory Commission ("FERC").

The California Energy Commission ("CEC") has reviewed the current condition of California's transmission infrastructure and concluded that it is fragile. Indeed, one unforeseen event affecting transmission last August resulted in an outage that affected much of the State. The CEC, in its "Strategic Transmission Investment Plan" described its conclusions as follows:

Disruptions on California's more than 31,000-mile electric transmission system can be catastrophic. As recently as August 25, 2005, the loss of the 500 kV Pacific DC Intertie from Oregon to Southern California caused rolling blackouts in Southern California, blacking out large blocks of the service territories of Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E). This line loss occurred just before 4 p.m. as California was fast approaching its peak electricity demand on a hot summer day. The line loss forced the ... [CAISO] to issue a Transmission Emergency Notice for Southern California and request that SCE and SDG&E reduce demand on the transmission system south of Path 26. This quickly escalated to the dropping of 800 megawatts (MW) of voluntary interruptible customers and 900 MW of firm load. The resulting outage to approximately 500,000 customers is the largest single disruption in California since the 2000-2001 energy crisis and is a graphic example of how a low-probability/high impact event, relatively short in duration, takes a disproportionately high social and economic toll on all Californians. This outage clearly demonstrates the need for comprehensive improvements to and investments in California's transmission system and highlights the inadequacies of current institutional arrangements to do so.<sup>6</sup>

Transmission from the desert southwest into San Diego via a corridor across Imperial Valley is needed to ensure that there is enough infrastructure available to meet San Diego area load beginning in 2010. Such a project would allow SDG&E and other load serving entities within the San Diego area to reliably serve their customers during periods of unusually high energy demand. Additionally, it would allow increased flexibility in operating California's transmission grid and provide additional import capability that may be urgently needed during a major outage or emergency event. Such transmission is needed to meet the CAISO's reliability requirements.

Since SDG&E built the Southwest Powerlink over 20 years ago (the only 500 kV connection between SDG&E and the grid), loads in the SDG&E service area have continued to grow.<sup>7</sup> The electric load served by the SDG&E transmission system is expected to grow by over 750 megawatts ("MW") over the next ten years (2006 through 2015). This is an increase of 19% and

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<sup>6</sup> California Energy Commission, "Strategic Transmission Investment Plan" at 1 (November, 2005).

<sup>7</sup> In 1983, when the SWPL was built, the peak demand in the SDG&E service area was about 2070 MW. In 2004, the SDG&E service area recorded a peak demand of 4,065 MW.



includes an expected reduction of 595 MW due to rather significant incremental energy efficiency savings and other demand-side measures that are assumed to occur over this period.<sup>8</sup>

SDG&E projects that beginning as early as 2010, there could be overlapping transmission and generation contingencies, as defined by the CAISO, under which the sum of available in-area generation and existing import capability could not meet load in the SDG&E service area during adverse weather conditions. In other words, absent increased transmission across the San Diego-Imperial Valley Corridor, or some other alternative, San Diego area customers are at risk for curtailment of firm service – rotating outages.

Reliability benefits encompass the ability to meet load under any reasonably plausible system condition as well as a range of system conditions that may fall outside of conventional planning standards. The G-1/N-1 criterion requires that there be sufficient in-area resources and transmission import capability to serve the full adverse peak demand forecast during the worst G-1/N-1 event. The CAISO's G-1/N-1 reliability requirement for the San Diego area transmission system dictates that the sum of (a) available in-area generation less the largest single in-area generator<sup>9</sup>, and (b) the maximum imports into the SDG&E service area assuming certain transmission contingencies, equals or exceeds the load within the service area under adverse weather peak load conditions. In particular, the CAISO's G-1/N-1 reliability criteria requires that there be no loss of load, thermal overloads, or unacceptable voltages in the event that (a) the largest generator in the local area and the most critical transmission element are already out of service, and (b) there is a subsequent outage of another transmission element.

Increasing the ability to import power from the desert Southwest will ensure that, if these overlapping contingencies occur during nearly any plausible adverse weather condition, all loads in the SDG&E service area could still be served. Indeed, absent such a project, if just the South Bay generating station retires as expected in late-2009, SDG&E will not be able to satisfy the CAISO's G-1/N-1 reliability requirement beginning in 2010, even with the needed addition of significant new in-basin generating capacity to be provided by the Palomar and Otay Mesa generating plants.

The California Energy Commission, in its "2005 Integrated Energy Policy Report", summarized well the conditions that the San Diego area faces and concluded that it needs new transmission into the area:

The San Diego region's transmission problems are acute and graphically illustrate the importance of adequate transmission. In 2001 SDG&E identified transmission

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<sup>8</sup> This compares SDG&E's peak demand of 4,058 MW recorded in 2005 to its expected peak demand of 4,813 MW in 2015, based on SDG&E's "50/50" peak demand forecast which has a 50% probability of being exceeded in any given year. It should be noted that 342 MW of energy efficiency demand reductions represent *future* savings and do not reflect the significant contribution of past energy efficiency achievements which are essentially embedded in the forecast.

<sup>9</sup> The CAISO's planning standards do not specifically indicate which generator should be considered the "G-1" outage for purposes of applying the CAISO's G-1/N-1 reliability criteria. However, in practice the CAISO has used the "largest" generator within a local area.

constraints and increasing congestion on its Mission-Miguel Line, a 230-kV line moving electricity from the southern part of its service territory to downtown San Diego. SDG&E at that time began the process of permitting and building upgrades to the line. By 2004, annual congestion costs totaled over \$32 million, increasing to \$48 million from July 2004 to July 2005. Over the next year until the Mission-Miguel upgrade finally comes online, congestion costs are expected to exceed \$50 million. The Mission-Miguel No. 2 Line required only minimal regulatory approval since it was located in an existing right-of-way. Still, even under a creatively developed construction plan, it took SDG&E three years to permit and another two years to build this critically needed upgrade.

SDG&E's transmission situation is very precarious. As its representative noted, "We have to weigh the question of do we take a line out to try to repair it. And if we do, we're sitting on one other line. And if we lose that line we can be in a blackout situation." For example, while making repairs to damage on two towers supporting 138-kV lines feeding Southern Orange County, SDG&E temporarily took one of the lines out of service. On July 28, 2005, the second line went out, causing 35,000 customers in Laguna Niguel to lose power."<sup>10</sup>

The table below illustrates the shortages that SDG&E projects under various scenarios absent development of transmission across the San Diego-Imperial Valley corridor.

**Without the Proposed Transmission Addition  
Surplus/(Deficiency) Outcomes (MW)**

<b>Year</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>No Retirements (with Otay Mesa)</b>	261	155	629	531	440	349	255	162	65	(35)
<b>Encina 4 Retired (with Otay Mesa)</b>	261	155	330	232	141	50	(44)	(137)	(234)	(334)
<b>No Retirements and No Otay Mesa</b>	261	155	88	(10)	(101)	(192)	(286)	(379)	(476)	(576)
<b>South Bay Retired (with Otay Mesa)</b>	261	155	629	531	(262)	(353)	(447)	(540)	(637)	(737)
<b>Encina All Retired (with Otay Mesa)</b>	261	155	629	531	440	(611)	(705)	(798)	(895)	(995)
<b>South Bay and Encina All Retired (with Otay Mesa)</b>	261	155	629	531	(262)	(1313)	(1407)	(1500)	(1597)	(1697)

The importance of reliable service without outage cannot be overstated. As discussed below, one of the purposes of building new transmission through the corridor into San Diego is to ensure SDG&E's continued ability reliably transmit an adequate level of power to all loads in the San

<sup>10</sup> California Energy Commission, "2005 Integrated Energy Policy Report" at 92-3 (November, 2005).

Diego area, particularly when the system is stressed by adverse weather condition or contingencies affecting service, such as fires or outages for other reasons. In 2001, AUS Consultants performed a study on the economic impact of potential outages in 2001 for the California Alliance for Energy & Economic Stability. This study is instructive for assessing the impact of outages caused by failure to site needed infrastructure. The AUS study concluded:

- Rolling blackouts that culminate in 20 hours of electricity outage [which is what they estimated the average customer would experience in 2001] will have significant adverse implications for growth of the state economy and will result in lost jobs and reduced income for Californians.
- Gross State Output (GSP) for California would be reduced by \$21.8 billion (constant 1996 dollars), or 1.7 percent, in 2001. This would reduce the growth rate of California GSP from the 2.3 percent currently [i.e. in 2001] projected by the UCLA Anderson Forecast to 0.6 percent for all of 2001. This loss has two components:
  - A direct loss of output experienced by all industries due to the effects of blackouts in the amount of \$6.8 billion. Of this, California's manufacturers would lose 18 percent, or more than \$1.2 billion.
  - An indirect effect reflecting the fact that each dollar of output by one industry represents the purchase of output (i.e. goods and services) by other industries. This amounts to \$14.9 billion.
- A loss of output of this magnitude would reduce household income for Californians by \$4.6 billion. This is a loss of \$104 for every one of California's 11.5 million households. Important to note is that this loss is in addition to the impact of higher electricity costs resulting from recent rate increases.
- 135,755 jobs would be lost in all industries in the California economy.<sup>11</sup>

Such impacts can have far-reaching local effects. For example, in a survey conducted by the Connecticut Business and Industry Association, 34% of respondents said they would shift business operations out of their state if they experienced ten or more 1-hour to 1-day unanticipated power losses over a quarter of a year.<sup>12</sup>

**Draft Criterion 2: Action is needed to achieve economic benefits for consumers.**

**And**

**Draft Criterion 3: Actions are needed to ease electricity supply limitations in end markets served by a corridor and diversify sources.**

The project that SDG&E is currently assessing for this proposed corridor will produce net energy savings of up to \$57 million per year over the life of the project. These savings will result from

<sup>11</sup> AUS Consultants, "Impact of a Continuing Electricity Crisis on the California Economy", May 3, 2001.

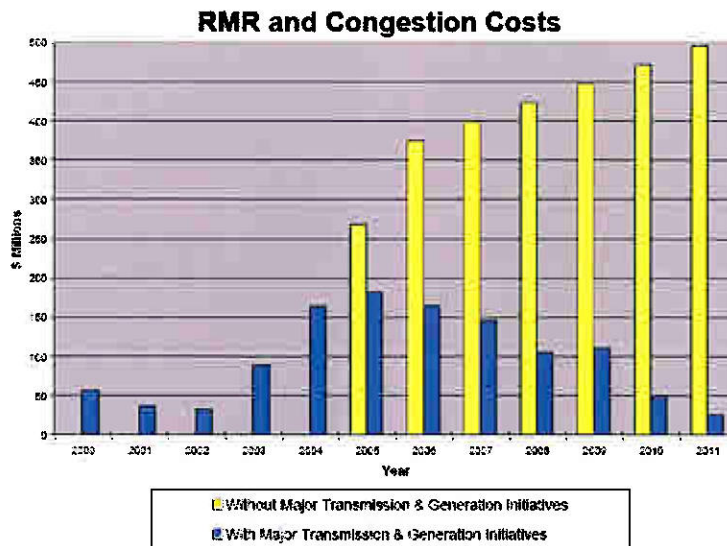
<sup>12</sup> <http://www.cbia.com/3news/2002Releases/EnergySurvey.htm>



reduced congestion and Reliability-Must-Run (“RMR”)<sup>13</sup> costs and increased access to lower-cost sources of power in the desert Southwest. SDG&E projects that the total energy savings provided by the project to all CAISO consumers, before accounting for the project’s fixed costs, are \$210 million per year on a levelized basis. This includes \$96 million per year in savings as a result of reduced congestion and higher grid dispatch efficiency throughout the CAISO control area, and \$114 million per year from reduced RMR contract costs in the San Diego service area.<sup>14</sup> Increasing RMR costs have been a significant issue for San Diego area customers.

The financial burden on SDG&E’s customers has been particularly acute. Congestion costs have increased to massive proportions over the past few years. Several years ago, SDG&E undertook an initiative to mitigate these costs to our customers (known as the Valley-Rainbow project), and state regulators rejected it. Had the state provided for new transmission into San Diego, it would have cut congestion costs to our customers by half. By having failed to do so, unless both new transmission and generation is added, SDG&E’s customers will see congestion costs nearly double again by 2010 to over \$450 million each year.

The following chart illustrates the projected increase in these costs over the next few years. This chart also shows the significant savings that will be provided by the major transmission and generation initiatives being aggressively pursued in the San Diego area.<sup>15</sup> The proposed transmission addition will further reduce RMR costs and secure greater energy savings for San Diego customers, particularly if the project is expeditiously completed and not unnecessarily delayed.



<sup>13</sup> RMR describes contracts between the CAISO and generators in certain constrained areas that require such generators to be available and run at the CAISO’s direction.

<sup>14</sup> The project will also provide about \$1 million per year savings as a result of reduced line losses.

<sup>15</sup> The chart reflects the combined effect of such measures as the Mission-Miguel transmission upgrade, and the future addition of major generation assets, most notably the Palomar plant (541 MW in 2006) and the Otay Mesa plant (561 MW in 2008). RMR as currently structured may not continue in the long-term. However, the fundamental nature of local reliability demands and the cost of meeting such demand must continue in one form or another.



A transmission line in this corridor will also augment existing transfer capability between the desert Southwest and California load centers and accommodate the retirement of aging and inefficient, gas-fired generation in the San Diego area by providing an increased ability to access capacity sources. By reducing congestion costs and losses, CAISO consumers<sup>16</sup> will be able to access low cost sources of power in the desert Southwest at reasonable prices. At the same time, the improved access offers developers of conventional power plants an incentive to build new, efficient, generating capacity. The project will also enhance competition among the generating companies that supply power to California, putting downward pressure on energy costs.

Not only would a transmission line in the proposed corridor meet the area's critical need for reliability, and reduce excessive congestion and RMR costs, adding transmission through this corridor also creates the opportunity for expansion at a later date by connecting with the 500 kV system to the north, completing a loop that will add further reliability. However, it is the east-west corridor between San Diego and Imperial Valley that requires urgent determination as a National Interest Electric Transmission Corridor.

Below, is a graphic showing the needed connection between San Diego and Imperial Valley, as well as the potential for a later north-south addition. The corridor is broadly defined as the connection between Imperial Valley and San Diego, without any specific route. A specific route is unnecessary and inappropriate for establishing a corridor.<sup>17</sup> Ultimately, the route that is used through this proposed corridor will depend on numerous political factors. For, example, as the California Energy Commission observed in its Strategic Transmission Investment Plan:

It should be noted that SDG&E faces significant land use constraints that will require resolution prior to completion of the project. The areas to the east of San Diego contain national and state parks, military bases, tribal lands, and new residential and other developments. The state-led transmission corridor planning process proposed in the Energy Commission staff's transmission report, *Upgrading California's Electric Transmission System: Issues and Actions for 2005 and Beyond*, could assist in addressing ROW routing issues associated with this project. The Energy Commission recommends forming a Corridor Study Group to ensure that coordination with local, state, and federal agencies, tribal organizations, landowners, interested parties, and other stakeholders begins immediately.<sup>18</sup>

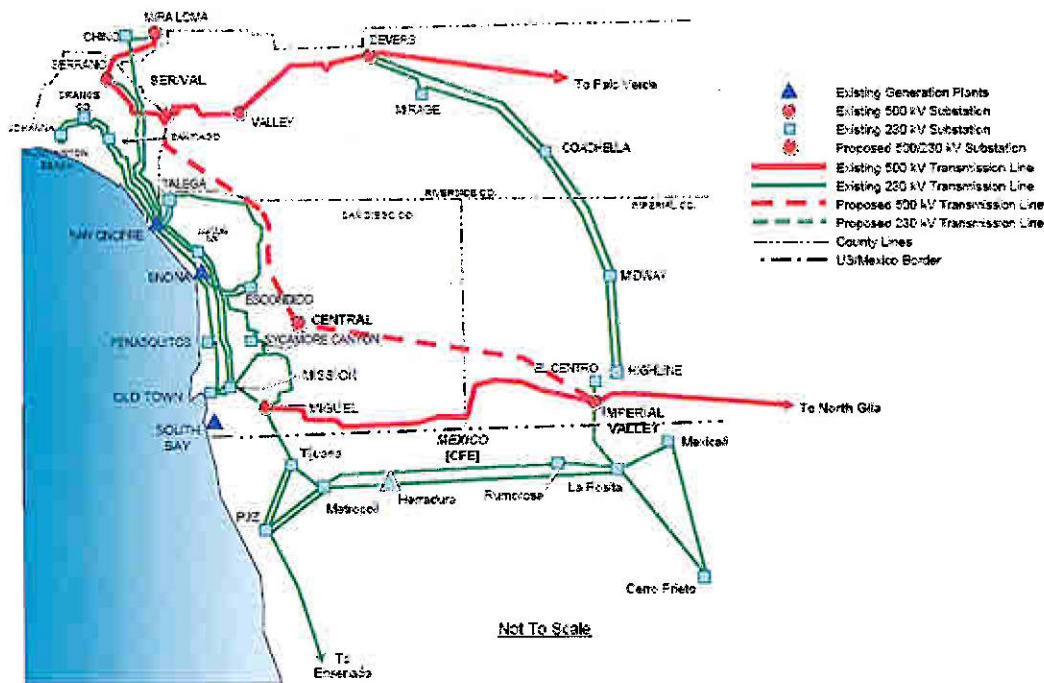
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<sup>16</sup> As noted previously, these benefits will accrue to ratepayers who receive transmission service from facilities that are under the operational control of the CAISO.

<sup>17</sup> "The Department expects to identify corridors for potential projects as generalized electricity paths between two (or more) locations, as opposed to specific routes for transmission facilities. The Department believes that defining corridors too narrowly would unduly restrict state authorities, FERC, and other relevant parties in determining whether and how to authorize the construction and operation of transmission facilities to relieve the identified congestion." 71 Fed. Reg. 5661 (Feb. 2, 2006).

<sup>18</sup> California Energy Commission, "Strategic Transmission Investment Plan" at 67 (November, 2005).

### Imperial Valley – Central – Serrano/Valley (completing the 500 kV loop)



#### **Criterion 4: Targeted actions in the area would enhance the energy independence of the United States.**

The Energy Policy Act identifies as a criterion for supporting designation as an NIETC enhanced diversification of resources and promotion of energy independence:

- '(ii) a diversification of supply is warranted;
- '(C) the energy independence of the United States would be served by the designation;

The proposed corridor to San Diego will provide more economical access to remote areas with the potential for significant development of renewable energy sources and will encourage the development of new renewable generation thereby diversifying the state's resource mix and reducing California's reliance on fossil fuels.

The California Energy Commission has concluded –

California needs major investments in new transmission infrastructure to interconnect with remote renewable resources in the Tehachapi and Imperial Valley areas, without which it will not be able to meet its RPS targets.<sup>19</sup>

<sup>19</sup> California Energy Commission, "2005 Integrated Energy Policy Report" at 89 (November, 2005).

SDG&E is moving aggressively to meet the 2010 goal of supplying 20% of SDG&E's bundled customer energy requirements with renewable energy sources. While some economically viable renewable resource potential appears to exist within the San Diego basin, principally wind generation on the eastern edge of SDG&E's service area and concentrating solar power in the Borrego Springs area, far greater quantities have been identified outside of the SDG&E service area. As clearly documented in both the IVSG report<sup>20</sup> and the San Diego Regional Renewable Energy Study Group Report,<sup>21</sup> the Imperial Valley and eastern San Diego County areas have significant geothermal, solar, and wind resource potential. Increasing the ability to import power from the Imperial Valley will allow SDG&E to meet the renewable resource goals at a cost that will not be burdened by high levels of congestion.

SDG&E has been negotiating with a number of developers to procure renewable energy resources in the Imperial Valley. A transmission link will ultimately be essential to delivering this renewable power to the San Diego area.<sup>22</sup> Through its negotiations, SDG&E has already taken significant steps to meet its renewable energy goals in 2010. SDG&E has signed a contract with Stirling Energy, a solar thermal developer, to purchase the output of a 300 MW facility to be located in the Imperial Valley. Commercial operation of this facility must begin no later than 2010. Two subsequent phases of the project could add another 600 MW of solar thermal power capability. The California Public Utilities Commission approved the contract for the first two phases in December 2005. SDG&E anticipates that the point of interconnection between the Stirling project and the CAISO grid will be at either the Imperial Valley substation; or at a new 500/230 kV substation that may be built along the proposed transmission line at a point that is on the edge of the Imperial Valley, due west of the southern tip of the Salton Sea. Either way, a transmission project in the San Diego-Imperial Valley corridor, along with other existing transmission connections between the Imperial Valley and the San Diego basin, will deliver a significant portion of the output of the Stirling project to the San Diego area.

**Criterion 6: Targeted actions in the area are needed to enhance the reliability of electricity supplies to critical loads and facilities and reduce vulnerability of such critical loads or the electricity infrastructure to natural disaster or malicious acts.**

As noted above, the designated San Diego-Imperial Valley corridor should be broadly defined without any specific route. However, there is one consideration that needs to be taken into account when designating this corridor in order to reduce the vulnerability of the new electricity infrastructure within this corridor to the consequences of certain events. This consideration involves the proximity of planned electric transmission lines to existing electrical facilities.

SDG&E is required to plan its transmission system to the reliability criteria of NERC/WECC and the CAISO. The NERC, WECC and CAISO planning standards generally provide that if a planned transmission circuit is to be adjacent to another transmission circuit, a case-specific

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<sup>20</sup> See *Development Plan for the Phased Expansion of Transmission to Access Renewable Resources in the Imperial Valley*, September 30, 2005, at [http://www.energy.ca.gov/ivsg/documents/2005-09-30\\_IVSG\\_REPORT.PDF](http://www.energy.ca.gov/ivsg/documents/2005-09-30_IVSG_REPORT.PDF) ; and *Potential for Renewable Energy in the San Diego Region* (August 2005) at: [http://www.renewables.org/docs/Web/Ch1\\_ExSummary.pdf](http://www.renewables.org/docs/Web/Ch1_ExSummary.pdf)

<sup>21</sup> *Potential for Renewable Energy in the San Diego Region*, dated August 2005 (<http://renewables.org>).

<sup>22</sup> Additional information regarding the outcome of these negotiations may be available at a later date.

analysis is required to determine whether the proximity of the circuits, and the geography that the adjacent circuits traverse, dictates specific mitigation measures for common mode contingencies (up to and including a determination that such proximity would constitute a violation of the planning standards<sup>23</sup>). An exception is made where multiple circuit towers are used over short distances (e.g., station entrance, river crossings).<sup>24</sup>

The case-specific analysis takes into account the probability of occurrence of an outage of two adjacent circuits on separate towers, line design, the distance that the two circuits are adjacent to each other, location, environmental factors, outage history of existing circuits, operation guidelines and separation between the circuits.<sup>25</sup> In general terms, if two circuits on separate towers are adjacent for only a short distance; or if the geography over which the two circuits are adjacent is not subject to wildfires, lightning strikes or other common mode contingencies; then the likelihood of the common mode contingency is considered improbable (sometimes called “non-credible”) and no mitigation is required.

On the other hand, if two circuits on separate towers are adjacent for a longer distance; or if the geography over which the two circuits are adjacent is subject to wildfires, lightning strikes or other common mode contingencies; then the common mode contingency is considered “credible” and mitigation, including the possibility of “Planned/Controlled” load drop, is required.

Applying the above reliability criteria to the San Diego-Imperial Valley corridor suggests that a new line could be constructed on separate towers adjacent to the existing 500 kV Southwest Powerlink only for a short distance without violating applicable reliability criteria or requiring “Planned/Controlled” load drop in the event of a common mode contingency event. If the two circuits were adjacent for longer distances, then it may be necessary to implement “Planned/Controlled” load drop in order to mitigate any unacceptable thermal line loadings or voltages that result because the distances that are practically available if the governing geography would make the facilities subject to common mode contingency events.

There have been 46 outages of the Southwest Powerlink in the last 15 years with 22 being fire-related within the San Diego County portion of the Southwest Powerlink. Since 1990, there have been two lightning strikes that tripped the Southwest Powerlink. These strikes also occurred on the San Diego County portion of the Southwest Powerlink.

Given the history of outages within the existing Southwest Powerlink corridor, and the reliability criteria exemption noted above, it is therefore acceptable to designate a San Diego-Imperial Valley corridor that includes the existing Southwest Powerlink within Imperial County (because

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<sup>23</sup> For example, Guide 4 of the CAISO’s Planning Standards do not allow more than 1400 MW of generation tripping as mitigation for a double contingency. Accordingly, if a case-specific analysis were to show that a simultaneous outage of two adjacent circuits was credible, and that required mitigation for such an outage involved tripping more than 1400 MW of generation, the planned adjacent transmission circuit would be in violation of applicable CAISO reliability criteria.

<sup>24</sup> See footnote “g” on Table I of the NERC/WECC Planning Standards.

<sup>25</sup> See, for example, Standard WECC-S2 and Guide WECC-G5 of the NERC/WECC Planning Standards and Risk Factors R1 through R11 of the WECC Reliability Subcommittee Common Corridor Task Force.



the possibility of an outage of two adjacent circuits would likely be considered non-credible), but excludes the existing Southwest Powerlink corridor in San Diego County (because the possibility of an outage of two adjacent circuits would likely be considered credible).

With this important caveat, SDG&E believes the San Diego-Imperial Valley corridor should be broadly defined.

**Criterion 8: The alternative means of mitigating the need in question have been addressed sufficiently.**

The Department lists as an addition potential criterion for assessing the potential for designation as an NIETC that “alternative means of mitigating the need in question have been addressed sufficiently.”

SDG&E has explored alternatives to transmission into San Diego. SDG&E conducted a Transmission Comparison Study as an open stakeholder process and reported the results of that study to the collaborative regional planning meetings of the Southwest Transmission Expansion Plan (“STEP”). The Study reviewed a total of eighteen potential transmission corridor alternatives (many of which were alternatives linking Imperial Valley and San Diego). This assessment determined that among the transmission alternatives, projects through a San Diego-Imperial Valley corridor provided greater benefits.

Additionally, SDG&E explored in-area generation alternatives. This study concluded that the in-area generation alternatives are not economic when compared to the “no project” reference case and are clearly less economic than the option of a San Diego-Imperial Valley corridor. While the in-area combined cycle alternative reduces net energy costs for consumers within the CAISO controlled grid, it takes a much larger capital investment to achieve the same level of energy benefits as the preferred corridor option: \$1.884 billion for the in-area combined cycle alternative versus \$1.015 billion to \$1.437 billion for the corridor option.

Not surprisingly, the in-area gas turbine alternative provides a lower level of energy benefits than does the in-area combined cycle alternative because of lower efficiency. The capital costs for the in-area gas turbine, while lower than the new combined cycle facilities, are nevertheless too high to overcome the efficiency advantage of the combined cycle facilities. Part of the reason that the capital costs of these options are not lower is that the in-area generation alternatives require significant transmission additions within the San Diego area to accommodate the maximum output of the generating facilities.

In addition, the in-area generation alternatives will not reduce RMR contract costs. The end result is that, when compared to the “no project” reference case, in-area the generation alternatives have benefit-to-cost ratios that range from 0.41/1 to 0.45/1. This analysis of the in-area generation alternatives does not include the capital costs that might be required on SDG&E’s natural gas delivery network to accommodate maximum electric output of the new generating facilities. These additional capital costs are estimated at between \$51 and \$364 million depending on whether the new combined cycle generation elects interruptible or firm gas delivery service. Interruptible service would require 5.7 miles of new gas pipe. Firm service

could require as much as 86 miles of new pipe. The additional capital costs also include on-site compression facilities. Including these additional costs in the economic analysis of the in-area generation alternatives would lower the overall benefit/cost ratios.

Economics aside, there are other reasons why in-area generation won't provide the long-term strategic benefits discussed in this filing. As a practical matter in-area generation that is effective in satisfying the CAISO's G-1/N-1 reliability criteria for the San Diego area transmission system must be fueled by natural gas. Recent events have demonstrated that the reliability and availability of natural gas supplies on a long-term basis are uncertain. It will be difficult to stabilize electricity prices for consumers within the San Diego area if the majority of in-area generation resources depend on the same volatile fuel source and if the ability of out-of-area suppliers to compete with in-area generation is constrained by import limitations.

Increasing import capability will allow a wider variety of resources to reach San Diego area consumers, thereby facilitating more competitive local and regional energy markets and minimizing any opportunity of local suppliers to exercise local market power. In contrast with the in-area gas-fired generation alternatives, transmission across the San Diego-Imperial Valley corridor affords cost-effective access to renewable resources that are mainly located in remote areas of the state and will connect to and traverse areas having the potential for significant levels of renewable resource development.

There are also practical limits to the amount of baseload generation that could be economically constructed within the San Diego basin. The WECC has established a south to north rating for the north of SONGS path ("Path 43") of 2,440 MW. When loads in the San Diego area are high, this limit is unlikely to be binding because a portion of the 2,150 MW output of the SONGS generating units will flow south into the San Diego area. The portion that flows north will be well below the 2,440 MW limit. However, when loads in the San Diego area are low, the output of in-area generation combined with imports into the San Diego area on the Imperial Valley-Miguel 500 kV line, and from Mexico on the 230 kV line, could easily exceed loads within the San Diego area and result in a northbound export on the five south of SONGS lines. These northbound exports would combine with the SONGS generation and easily consume all of the remaining south-to-north capability on the north of SONGS path. This situation would be aggravated with additional in-area baseload generation. When south to north flows reach the path rating, the CAISO will impose its congestion management protocols and it will be necessary to reduce the output of this baseload generation and/or curtail imports into the San Diego area from the desert Southwest and Mexico. This will cause local prices to drop. The combined effect of reduced output and lower prices during low load periods could compromise the economic viability of additional in-area baseload generation.

### **The Imperial Valley-San Diego Corridor Is Ripe For Urgent Consideration.**

The Department's February, 2006 Notice (at 71 Fed. Reg. 5661) invites parties to identify "geographic areas or transmission corridors for which there is a particularly acute need for early designation as NIETC". SDG&E submits that a San Diego-Imperial Valley corridor described above is ripe for such priority consideration for two reasons.

First, as demonstrated above, the San Diego region has a reliability need for a substantial transmission interconnection from the east of San Diego in 2010. For any designation of the necessary corridor through the Imperial Valley to support this national interest need, the designation should be made by the August 8, 2006 deadline provided by the Act. It will take at least three years to license and build the needed transmission interconnection, so the “backstop” federal authority provided in the Act must be in place by the end for this year to protect the national interest in the San Diego region as Congress intended. We submit that this is the sort of “acute” need contemplated by the Federal Register notice.

Second, the Department will not have to study the need for this corridor based on a blank slate. As described above, the need for a transmission interconnection to San Diego through Imperial Valley is amply documented in recent studies and regulatory findings, all of which resulted from transparent, multi-stakeholder processes. The Department will be armed with this trove of accessible and reliable information as it considers this designation, and is therefore well-positioned to give this designation priority consideration.

### **Conclusion**

SDG&E appreciates the opportunity to comment. For the reasons described above, SDG&E asks that the Department consider, on a priority basis, designating a San Diego-Imperial Valley corridor as an NIETC, and that this designation be published by the statutory deadline of August 8, 2006.

Respectfully submitted,



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JPA/m